Provisionally Accredited Levees

May 2007

FEMA

Provisionally Accredited Levees

Overview

Over one quarter of the counties that the Federal Emergency Management Agency (FEMA) is mapping as part of its Flood Map Modernization (Map Mod) effort has levees shown on their effective flood map. This affects millions of Americans. Therefore, the need to accurately show the risk of flooding behind levees is obvious. Citizens, community officials, builders, insurance agents, lenders, and others need to understand the risk to life and property that resides behind levees—risk that even the best flood-control system can not completely eliminate.

It is important to note that FEMA does not perform levee evaluations—this is the responsibility of the levee owner. A levee owner can be a Federal or State agency, a water management or flood control district, a local community, a levee district, a nonpublic organization, or an individual. The party responsible for operating and maintaining the levee must be a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the National Flood Insurance Program (NFIP).

FEMA is responsible for the following:

- Establishing appropriate risk zone determinations and reflecting these determinations on flood maps
- Establishing mapping standards, including minimum design, operation and maintenance criteria that must be met to have a levee recognized as providing flood protection. FEMA will only recognize on its flood maps those levee systems that have met and continue to meet these minimum standards

FEMA is not responsible for the following:

- Designing, operating, certifying, or maintaining levee systems
- Examining levees
- Determining how a structure or system will perform in a flood event

What is a levee?

A levee is a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

What is a Provisionally Accredited Levee (PAL)?

A levee that FEMA has previously accredited with providing 1-percent-annual-chance protection on an effective Flood Insurance Rate Map (FIRM) or digital FIRM (DFIRM), and for which FEMA is awaiting data and/or documentation that will demonstrate the levee's compliance with 44 CFR Section 65.10 of the NFIP regulations. A PAL is shown on a DFIRM as providing 1 percent-annual-chance flood protection, and the area landward of the levee is shown as Zone X (shaded) except for areas of residual flooding, such as ponding areas, which will be shown as Special Flood Hazard Area.

FEMA's mapping requirements are designed to provide the people living and working behind the levee with appropriate risk information so that they may minimize damage and loss of life. The requirements contain the technical information on design criteria as well as operation and maintenance plans.

The regulatory requirements for FEMA to recognize the flood protection capabilities of levees are found in Title 44, Chapter 1 of the Code of Federal Regulations Section 65.10 (44 CFR Section 65.10), which you may view on FEMA's Web site at www.fema.gov/plan/prevent/fhm/lv_fpm.shtm.

Compliance with 44 CFR Section 65.10 requirements rests with communities, levee owners, and/or local project sponsors—not FEMA. FEMA's responsibility is solely to review the information provided and either accredit the levee as providing 1-percent-annual-chance flood protection on the flood map or, when the levee is shown to be inadequate, to reveal the risk of flooding behind that levee to the community and the public.

To help clarify its evaluation and mapping requirements for areas behind levees, FEMA has issued two Procedure Memorandums—Procedure Memorandum No. 34 (PM 34) and Procedure Memorandum No. 43 (PM 43). You may view the PMs on FEMA's Web site at www.fema.gov/plan/prevent/fhm/gs_memos.shtm.

On August 22, 2005, FEMA issued PM 34 – *Interim Guidance for Studies Including Levees* – to help clarify the responsibility of community officials or other parties seeking recognition of a levee in providing information on levees identified during a study/mapping project. PM 34 provided clarification of procedures to minimize delays in near-term study/mapping projects and to aid mapping partners in properly assessing how to handle levee mapping issues.

Documentation required to accredit a levee as providing 1-percent-annual-chance flood protection often is outdated or missing altogether. As part of a study/mapping project, PM 34 indicates that it is the levee owner or community's responsibility to provide documentation that the levee meets the requirements of 44 CFR Section 65.10.

Levees that are presently shown as providing 1-percent-annual chance flood protection may qualify for the Provisionally Accredited Levee, or PAL, designation on a DFIRM. PM 43 – *Guidelines for Identifying Provisionally Accredited Levees*, issued as revised on March 16, 2007 – describes five scenarios (see below) for determining when a levee does or does not qualify as a PAL. A PAL is shown in a DFIRM as providing 1-percent annual-chance flood protection and the area landward of the levee is shown as Zone X (shaded) on a flood map except for areas of residual flooding such as ponding areas which will be shown as a Special Flood Hazard Area and labeled Zone A or AE, depending on the type of study performed for the area.

If a levee qualifies for the PAL designation, FEMA will provide the community 90 days to sign and return an agreement that indicates the data and documentation to comply with CFR Section 65.10 requirements will be provided within 24 months of the 90- day agreement period. If the signed agreement is not returned to FEMA within 90 days, the levees in the community are no longer eligible for the PAL designation. If the levee owner believes that the levee meets the requirements of 44 CFR Section 65.10 with the exception of maintenance deficiencies, the levee owner can request a 1-year correction period. If the levee does not meet the PAL requirements (including specific reporting deadlines depending upon the levee's status) the area landward of the levee will be remapped as Zone AE or Zone A depending on the type of study performed for the area.

The U.S. Army Corps of Engineers (USACE) has initiated a national levee inventory and assessment program to identify the condition, location, level of protection, and maintenance activities for all levees within its jurisdiction. This inventory will assist in the assessment of the risk to public safety associated with levees and levee systems across the Nation. The USACE and FEMA are working together throughout the inventory and assessment phase to coordinate this effort with Map Mod activities. The inventory data collected will be used by FEMA and the USACE to categorize levees for which the full

documentation required by 44 CFR Section 65.10 is not readily available into the five scenarios described below.

For levees that are included in the USACE Federal program, FEMA will actively coordinate with the appropriate USACE district to determine which projects do not provide protection from the 1-percent-annual-chance flood. In a collaborative effort, existing data or project-specific information will be evaluated to identify and validate levees not accredited in the USACE's inventory.

For levees within its program, the USACE determines which levees will be offered a one-time-only 1-year maintenance deficiency correction period. This period was established to allow public sponsors/levee owners to correct levee maintenance deficiencies before the levee is placed in an inactive status in the USACE Rehabilitation & Inspection Program and becomes ineligible for Public Law 84-99 rehabilitation assistance. After coordinating with FEMA, the USACE will inform communities or levee owners of this status by letter.

It is important that communities and individuals have the most accurate and up-to-date information to make decisions based on the flood risk that exists in areas behind levees. FEMA established this approach to allow the mapping to move forward for levees meeting the criteria identified in the scenarios below. This approach also gives communities and levee owners a specified timeframe for the submittal of the full documentation necessary to show compliance with 44 CFR Section 65.10.

On the following pages are five possible scenarios for how PM 43 may be applied in different circumstances.

Non-USACE Program levees are defined to include the following:

- Levees not authorized by the U.S. Congress or other Federal agency authority;
- Levees built by other Federal agencies and not incorporated into the USACE Federal system;
- Locally built and maintained levees built by a local community; and
- Privately built by a nonpublic organization or individuals and maintained by a local community.

WARNING: Provisionally Accredited Levee. For explanation, see the Notes to Users.

The following Note to Users will be added:

WARNING: This levee, dike, or other structure has been provisionally accredited and mapped as providing protection from the 1-percent-annual-chance flood. To maintain accreditation, the levee owner or community is required to submit documentation necessary to comply with 44 CFR Section 65.10 by (_____ _____,_____). Because of the risk of overtopping or failure of the structure, communities should take proper precautions to protect lives and minimize damages in these areas, such as issuing an evacuation plan and encouraging property owners to purchase flood insurance.

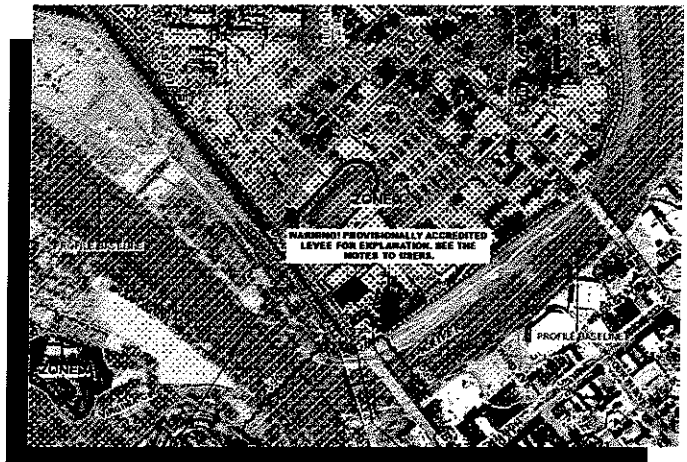
Scenario A

In this scenario, a levee that is not in the U.S. Army Corps of Engineers (USACE) Federal System (i.e., a non-USACE levee) is shown on the effective flood map as providing protection from the 1-percent-annual-chance flood. This scenario includes two different possibilities.

In this case, the FEMA Regional Office will send a letter to the appropriate levee owner or community identifying those levees for which 44 CFR Section 65.10 documentation is needed and provide a copy of this letter to the appropriate USACE district office. The FEMA letter will describe the PAL option and a potential option for a one-time-only, 1-year "maintenance deficiency correction period" associated with maintenance-deficient levees. This letter will also request that the community/levee owner submit, within 90 days, one of the following:

- A signed agreement stating that, to the best of the community's/levee owner's knowledge, the levee in question meets 44 CFR Section 65.10 requirements and all requirements for a PAL application package. This is called Scenario A1.

- A signed letter stating that the community/levee owner has been notified of the one-time-only, 1-year "maintenance deficiency correction period" and agrees to proceed according to the associated process and requirements. This one time-only "maintenance deficiency correction period" will expire 1 year from the 91st day following the date of the initial notification letter. This is called Scenario A2.



DFIRM Showing a PAL

Scenario A1:

If the community/levee owner believes that the levee meets 44 CFR Section 65.10 requirements at that time, then they may qualify for Scenario A1.

If the full documentation required to show compliance with 44 CFR Section 65.10 is readily available when the initial notification letter is sent, FEMA will request that the community/levee owner provide these documents within 30 days. If additional time is required to gather the proper documentation, the community/levee owner will choose to submit the PAL application package. For any community/levee owner that chooses the PAL option, the requirements for 44 CFR Section 65.10 must be submitted within 24 months of the 91st day following the date of the initial notification letter. Certification by a Registered Professional Engineer must accompany the submitted 44 CFR Section 65.10 data in compliance with Paragraph 65.10(e). In addition, the community/levee owner must submit a progress report to FEMA after 12 months to document progress toward obtaining 44 CFR Section 65.10 data and documentation.

Several conditions exist that may require FEMA to take immediate action to rescind the PAL designation and revise the DFIRM to show the area landward of the levee as Zone AE or Zone A (depending upon the type of study performed for the area):

- Neither the signed PAL agreement nor a request for a maintenance deficiency correction period is returned to FEMA before the 91st day following the date of the notification letter;

- The full documentation required for compliance with 44 CFR Section 65.10 is not provided within 24 months of the 91st day following the date of the initial notification letter; or

- The 12-month progress report is not provided to FEMA, and the FEMA Regional Office believes the PAL agreement should be rescinded.

Scenario A2:

If the community/levee owner believes that the levee meets 44 CFR Section 65.10 requirements with the exception of maintenance deficiencies, then they may qualify for Scenario A2.

Once the community/levee owner determines that maintenance deficiencies exist, the community/levee owner will have 90 days from the date of the initial notification letter to submit a signed letter requesting the maintenance deficiency correction period. At a minimum, this letter must clearly state:

- The only grounds for the levee in question not currently meeting the 44 CFR Section 65.10 requirements or PAL requirements are maintenance issues; and
- Within the 1-year "maintenance deficiency correction period," the community/ levee owner can remedy the maintenance deficiencies and submit one of the following:
    - All documentation necessary to comply with the requirements listed in 44 CFR Section 65.10; or
    - A request for a PAL designation and the entire PAL application package (PAL application requirements listed below).

If the community/levee owner submits a response before the 91st day following the date of the initial notification letter, the FEMA Regional Office will notify the community/ levee owner that the current study/mapping project will move forward and show the area landward of the levee as Zone AE or Zone A (depending upon the type of study performed for the area). The notification will state that the Letter of Final Determination (LFD) and effective DFIRM will be delayed until the 1-year correction period has elapsed. For FEMA to remove the Zone AE or Zone A designation landward of the levee, the community and/or levee owner must submit the following within the 1-year correction period:

- All the requirements listed in 44 CFR Section 65.10; or
- A request for a PAL designation and the entire PAL application package (PAL application package requirements listed below).

If all the data and documents required to comply with 44 CFR Section 65.10 are submitted before the 1-year correction period has elapsed, FEMA will issue the LFD and show the levee on the effective DFIRM as accredited. However, if a request for a PAL designation and a PAL application package are submitted and approved before the 1-year correction period has elapsed, then FEMA will issue the LFD and show the levee on the effective DFIRM as provisionally accredited. In addition, for the PAL option, the community/levee owner must provide a progress report to the FEMA Regional Office after 12 months to document progress toward obtaining 44 CFR Section 65.10 data

If any of the following alternatives occur, FEMA will direct the contractor or mapping partner to remap the area landward of the levee as Zone AE or Zone A, depending upon the type of study performed for the area:

- The community/levee owner does not submit a signed response letter before the 91st day following the date of the initial notification letter.
- The community/levee owner is granted the 1-year correction period, but does not submit the required data within the 1-year correction period.
- The submitted deficiency correction data are determined to be inadequate.
- A request for a PAL designation and the entire PAL application package is not submitted and approved before the 1-year correction period has elapsed.
- The 12-month PAL progress report is not provided to FEMA, and the FEMA Regional Office believes the PAL designation should be rescinded.
- The full data and documentation required to comply with 44 CFR Section 65.10 is not provided within 24 months of the final day of the correction period.
- The data and documentation submitted to meet the requirements of 44 CFR Section 65.10 or the PAL application is determined to be inadequate.

Scenario B:

In this scenario, the levee is in the USACE Federal System and is shown on the effective flood map as providing protection from the 1-percent-annual-chance flood and there is no information indicates the levee does not provide this level of protection Additionally, the project inspection rating is within an acceptable range (as defined by USACE).

If full documentation to comply with the requirements of 44 CFR Section 65.10 is readily available when the initial notification letter is sent, the FEMA Regional Office will request that the community/levee owner/local project sponsor provide these documents within 30 days. If the community/levee owner/local project sponsor requires time to gather the proper documentation, they should choose to submit the PAL Application Package.

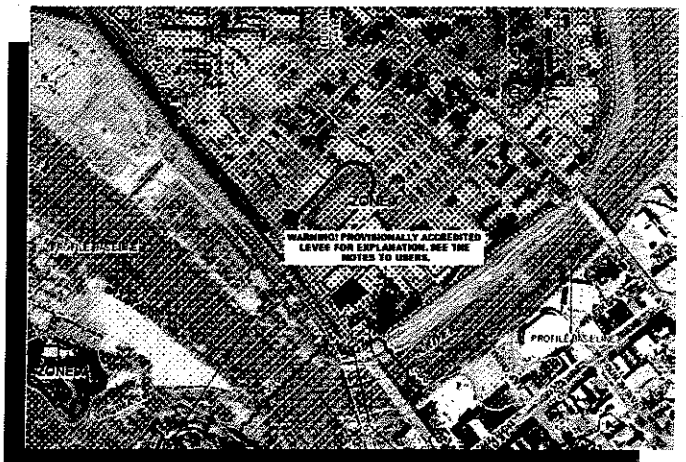
For any community/levee owner/local project sponsor that chooses the PAL, the documentation required to comply with 44 CFR Section 65.10 requirements must be submitted within 24 months of the 91st day following the date of the initial notification letter. Certification by a Registered Professional Engineer must accompany the submitted 44 CFR Section 65.10 data in compliance with Paragraph 65.10(e). An official letter from the USACE certifying that the levee has been adequately designed and constructed to provide 1-percent-annual-chance flood protection may be submitted in lieu of the certification noted above. In addition, the community/levee owner/local project sponsor must submit a progress report to FEMA after 12 months to document progress toward obtaining data and documentation to comply with 44 CFR Section 65.10

Several conditions could occur that may result in the PAL designation being rescinded and FEMA taking immediate action to revise the DFIRM in the area landward of the levee. If any of the following conditions apply, FEMA will direct the contractor or mapping partner to remap the area landward of the levee as Zone AE or Zone A, depending upon the type of study performed for the area:

- The signed PAL agreement is not returned to FEMA within 90 days of the initial notification letter.
- The full documentation for 44 CFR Section 65.10 is not provided within 24 months of the final day of the 90-day agreement period.
- The 12-month PAL progress report is not provided to FEMA, and the FEMA Regional Office believes rescission is necessary.
- The data submitted to meet the requirements of 44 CFR Section 65.10 or the PAL application is determined to be inadequate.

USACE levees are defined to include:

- Levees built by the USACE that were authorized for construction by the U.S. Congress or by USACE continuing authorities (e.g., Section 205);
- Levee projects constructed by non-Federal interests or other (non-USACE) Federal agencies and incorporated into the USACE Federal system by specific congressional action;
- Federal projects that are either operated and maintained by the USACE or turned over to a local sponsor for operation and maintenance; and
- Non-Federal projects within the Rehabilitation and Inspection Program (RIP), Public Law 84-99.



DFIRM Showing a PAL

Scenario C:

In this scenario, the levee is in the USACE Federal System and is shown on the effective flood map as providing protection from the 1-percent-annual-chance flood. However, the USACE has determined that the levee's recent inspection ratings are "Fair," "Poor," or "Unacceptable."

Scenario C includes two different possibilities:

Scenario C1:

- The USACE has determined that the levee's recent inspection ratings are listed as fair, poor, or unacceptable;
- The USACE has determined that the project status in the RIP has been switched from active to inactive; and
- The USACE has not provided a 1-year maintenance deficiency correction period for the levee.

The FEMA Regional Office will coordinate with the appropriate USACE District office regarding levee projects in the USACE inventory that have received an inspection rating of fair, poor, or unacceptable. The USACE will evaluate any existing data or project-specific information to determine that the levee does not provide 1-percent-annual-chance flood protection.

Once these projects have been identified, the USACE will send a notification letter to the community/levee owner/ local project sponsor to inform them that the levee status has been switched from active to inactive in the USACE RIP and is no longer eligible for PL 84-99 rehabilitation assistance because of maintenance deficiencies. These deficiencies will not allow the levee to meet the minimum requirements of the 44 CFR Section 65.10; thus, the levee does not provide 1-percent-annual-chance flood protection. The deficiencies will be identified in the USACE letter. The USACE District office will provide a copy of this letter to the FEMA Regional Office. The FEMA Regional Office then will send a letter to the community/levee owner/local project sponsor stating that the area landward of the levee will be remapped as Zone AE or Zone A, depending upon the type of study performed for the area.

These levee systems will not be eligible for the PAL option.

Scenario C2:

- The levee has received an fair, poor, or unacceptable inspection rating;
- The levee was in an active status in the USACE RIP prior to September 30, 2005 (FY06); and
- The USACE has offered a one-time-only, 1-year "maintenance deficiency correction period" to remedy the maintenance deficiencies of the levee.

Once these projects have been identified, the USACE will send a notification letter to the community/levee owner/ local project sponsor to inform them of the levee's specific maintenance deficiencies. This letter will also inform the community/levee owner/local project sponsor that they are eligible for the one-time-only, 1-year "maintenance deficiency correction period," which provides them 1 year to resolve any levee maintenance deficiencies. The USACE District office will provide a copy of this letter to the FEMA Regional Office.

The FEMA Regional Office then will send a letter to the community/levee owner/local project sponsor explaining the PAL option (Scenario C2) and that FEMA will proceed with the current study/mapping project and will remap the area landward of the levee that will be mapped as Zone AE or Zone A, depending upon the type of study performed for the area. The LFD and effective DFIRM will be delayed until the 1-year correction period has elapsed.
For FEMA to remove the Zone AE or Zone A designation landward of the levee, the following requirements must be met within the 1 year correction period:

- Evidence has been provided to show that the maintenance deficiencies have been remedied. This evidence will be provided to the FEMA Regional Office by the appropriate USACE District office.
- All of the requirements listed in 44 CFR Section 65.10 have been addressed or a request for a PAL designation and the entire PAL application package has been submitted.

The FEMA Regional Office will coordinate with the appropriate USACE District regarding levee projects to evaluate and determine the adequacy of any data submitted before the 1-year correction period has elapsed. If the data complies with 44 CFR Section 65.10, FEMA will issue the LFD and show the levee on the effective DFIRM as accredited. Alternatively, if a request for a PAL designation and a PAL application package are submitted and approved before the 1-year correction period has elapsed, then FEMA will issue the LFD and show the levee on the effective

DFIRM as provisionally accredited. In addition, to the community/levee owner/local project sponsor must submit a progress report to FEMA after 12 months to document progress toward obtaining documentation and data to comply with 44 CFR Section 65.10.

If any of the following alternatives occur, FEMA will direct the contractor or mapping partner to remap the area landward of the levee as Zone AE or Zone A, depending upon the type of study performed for the area:

- The community/levee owner/local project sponsor is granted the 1-year correction period, but does not submit the required data within the 1-year correction period.
- The submitted deficiency correction data is determined to be inadequate.
- The 12-month PAL progress report is not provided to FEMA, and the FEMA Regional Office believes the PAL designation should be rescinded.
- A request for a PAL designation and the entire PAL application package is not submitted and approved before the 1-year correction period has elapsed.
- The full documentation necessary to comply with 44 CFR Section 65.10 is not provided within 24 months of the final day of the correction period.
- The data submitted to meet the requirements of 44 CFR Section 65.10 or the PAL application are determined to be inadequate.

Scenario D:

In this scenario, the levee is in the USACE Federal System and is not shown on the effective flood map as providing protection from the 1-percent-annual-chance flood. There is no issue with how to map the area behind the levee because it previously has been determined that the levee does not provide 1-percent-annual-chance flood protection. The flood map will continue to show the levee as not providing 1-percent-annual-chance flood protection unless it is determined that the levee actually does provide this level of protection.

These levee systems will not be eligible for the PAL option.

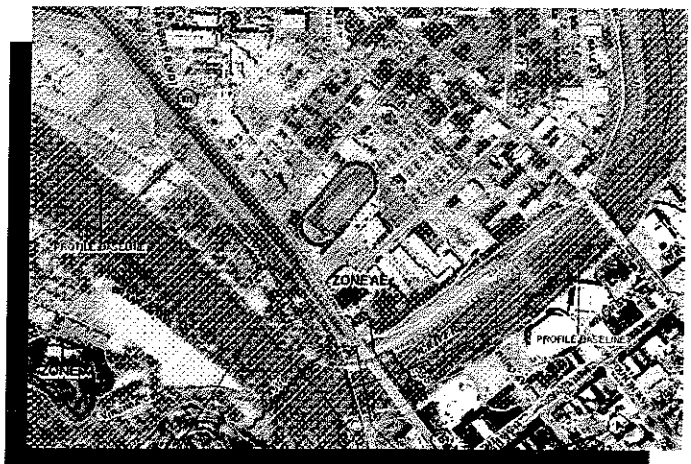
Scenario E:

In this scenario, the levee is in the USACE Federal System and is shown on the effective flood map as providing protection from the 1-percent-annual-chance flood. However, the USACE has determined, and FEMA has validated, that the levee does not meet an adequate level of protection. Although the levee inspection rating is not listed as fair, poor, or unacceptable, the levee may have failed or experienced overtopping by less than the 1-percent-annual-chance flood.

The FEMA Regional Office will verify the engineering and mapping data used to produce the effective FIRM and determine whether it is the most up-to-date information, based on the best available data. However, the FEMA Regional Office will also determine if better data are available than the data used to produce the effective FIRM. The FEMA Regional Office will coordinate with the USACE district office to either verify the current flood data are the best available or provide the more recent and accurate data. The USACE district office will use the best available data, as identified by the FEMA Regional Office, to determine whether the levee provides an adequate level of protection.

The FEMA Regional Office will notify the community, levee owner, or local project sponsor that the levee no longer provides 1-percent-annual-chance flood protection. FEMA also will provide the reasons for the levee no longer providing protection. If the project sponsor cannot provide the documentation necessary to show compliance with 44 CFR Section 65.10, the area landward of the levee will be mapped as Zone AE or Zone A, depending upon the type of study performed for the area.

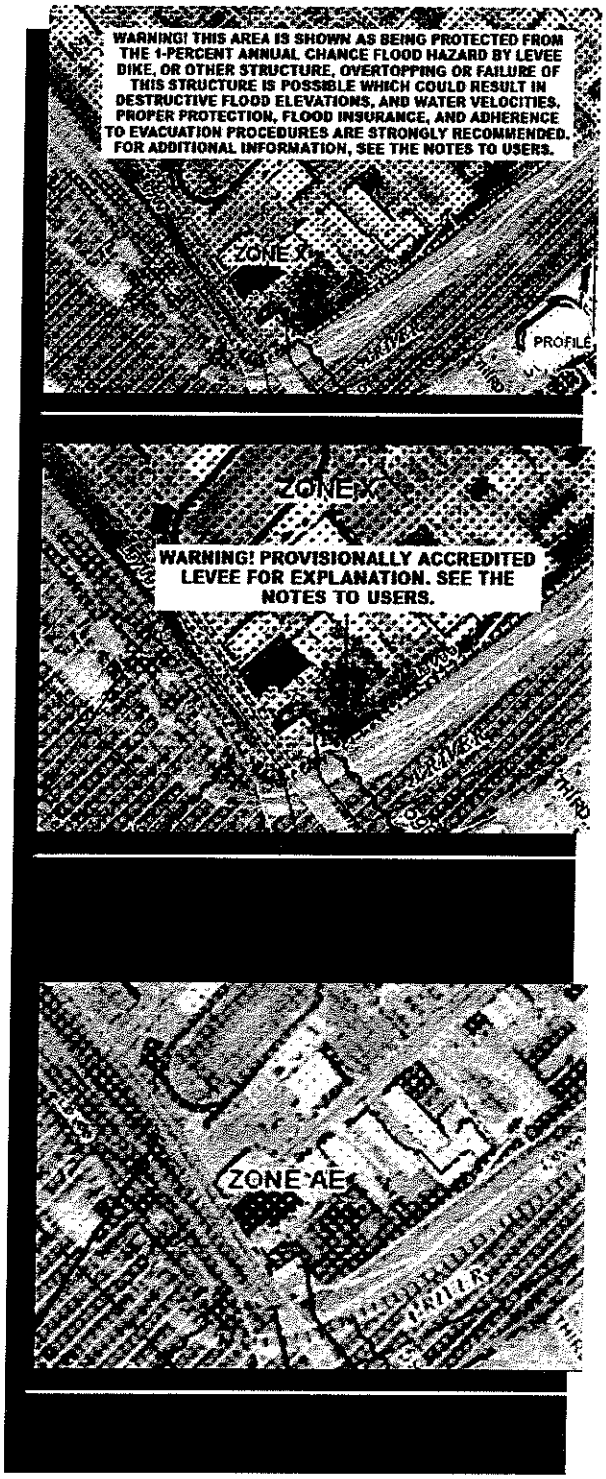
These levee systems will not be eligible for the PAL option.



DFIRM Showing Zone AE

How Will FEMA Map Levees?

FEMA's mapping requirements are designed to provide the people living and working behind the levee with appropriate risk information so that they may minimize damage and loss of life. It is important to note that FEMA does not evaluate the performance of a levee—this is the responsibility of the levee owner. FEMA is responsible for establishing mapping standards and risk determination zones and reflecting these determinations on flood maps.



Levee Accredited on FIRM

An accredited levee is a levee that FEMA shows on a FIRM as providing protection from the 1-percent-annual-chance or greater flood. This determination is based on the submittal of data and documentation as required by the NFIP regulations. The area landward of an accredited levee is shown as Zone X (shaded) on the FIRM except for areas of residual flooding, such as ponding areas, which will be shown as Special Flood Hazard Area. Flood insurance is not mandatory in Zone X (shaded); however, it is strongly encouraged for all structures in areas behind levees.

Provisionally Accredited Levee (PAL)

A PAL is a designation for a levee that FEMA has previously accredited with providing 1-percent-annual-chance flood protection on an effective FIRM, and for which FEMA is awaiting data and/or documentation that will show the levee's compliance with NFIP regulations. Before FEMA will designate a levee as a PAL, the community or levee owner will need to sign and return an agreement that indicates that documentation required for compliance with 44 CFR Section 65.10 of the NFIP regulations will be provided within a specified timeframe, depending upon the levee's status. Flood insurance is not mandatory for structures behind a levee with provisional status however, it is strongly encouraged.

Levee Not Accredited or De-accredited on FIRM

If the levee is not shown as providing protection from the 1-percent-annual-chance flood on an effective FIRM, the levee is considered "not accredited" and is mapped as Zone AE or Zone A, depending upon the type of study performed for the area. If the levee was previously shown providing protection from the 1-percent-annual-chance flood on an effective FIRM but does not meet the Provisionally Accredited Levee (PAL) requirements or is no longer eligible for the PAL, FEMA will "de-accredit" the levee and the area landward of the levee will be remapped as Zone AE or Zone A (high-risk flood zones) depending on the type of study performed for the area. Flood insurance will be required for structures with a federally backed mortgage.

For more information on levees, please visit FEMA's Web site at:

www.fema.gov/plan/prevent/fhm/lv_intro.shtm.

Federal Emergency Management Agency

Washington, D.C. 20472

August 22, 2005

MEMORANDUM FOR: Regional Directors
Regions I - X

FROM: David I. Maurstad, Acting Director
Mitigation Division

SUBJECT: Procedure Memorandum 34 — Interim Guidance for Studies Including Levees

Background: Throughout the United States, levees protect numerous communities and large expanses of agricultural land from floods. Their importance in mitigating flood hazards and their relevance to the National Flood Insurance Program (NFIP) are indisputable. However, riverine and coastal levees, in the aggregate, stretch for tens of thousands of miles, and information on their location, structural integrity, and certification often is outdated or missing altogether.

Issue: To address this challenge, a Levee Coordination Committee—including representatives from FEMA, other Federal agencies, and States—is examining current levee regulations and assisting in the development of a long-term policy that protects citizens and property, while accommodating the needs of the NFIP. This memorandum helps to clarify the entities responsible for providing information on levees identified during a mapping project.

Action Taken: Until the new policy is developed, this memo provides interim guidance to minimize delays in near-term mapping studies. The attached flow chart supplements FEMA's procedure memorandums 30 and 32. This information is in conformance with Section 65.10 of the NFIP regulations.

Supplement to Procedure Memo 30—FEMA Levee Inventory System.

Mapping partners – CTPs, IDIQs, OFAs, etc. -- should continue providing information about levees located in or adjacent to study areas. Information should be provided via the FEMA Levee Inventory System (FLIS) according to Procedure Memorandum 30 and the instructions available on the FLIS Web site located at http://flis.pbsjdfirm.com. The FLIS will be accessed via the MIP after release 3.0.

Levee coordinates should be gathered at a level of detail consistent with GIS accuracy and digital Flood Insurance Rate Map (FIRM) standards. Mapping partners who do not already have access to the FLIS can contact the National Service Provider at (703) 960-8800.

Supplement to Procedure Memo 32—Levee Review Protocol.
The protocol for levee reviews, particularly the details provided in Table 1 of Procedure Memorandum 32, is revised according to the attached flow chart.

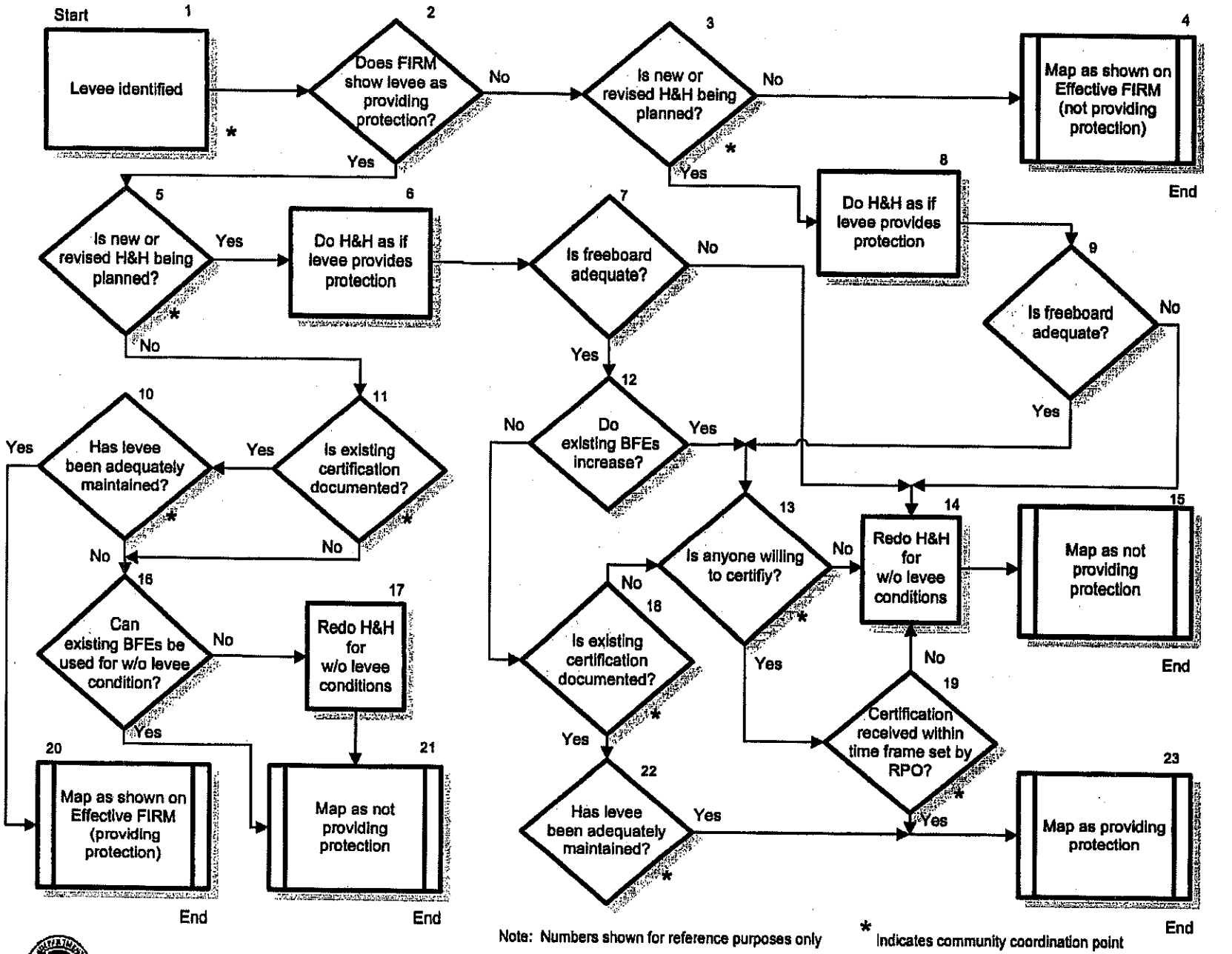
Identification of Levees
It is critical that all levees within the scope of the mapping project be identified early in the mapping project, ideally no later than the scoping meeting. The role of all mapping partners, including coordination with the State and other Federal partners (e.g., U.S. Army Corps of Engineers), related to review of levee certification should be clearly identified as part of the scoping process. When levees are identified at the scoping meeting the community must be informed of the data requirements for FEMA to recognize a levee as providing protection from the 1-percent-annual-chance flood (base flood) on the FIRM. In accordance with 44 CFR Section 65.10(a), it is the responsibility of the community or other party seeking recognition of a levee system at the time of a flood risk study or restudy to provide the data outlined in 44 CFR Section 65.10. FEMA will not be conducting detailed examinations of levees to determine how a structure or system will perform in a flood event. In addition, the community or party seeking recognition should be provided with a deadline for submitting the data and informed that if the data are not submitted by the deadline, the levee cannot be recognized as providing protection from the base flood as part of the current mapping effort. However, a revision could be initiated once data are available.

Early identification of levees allows the mapping partner to outline to the community, or party seeking recognition, their responsibilities and FEMA's expectations to minimize study delays. In order to aid our mapping partners in properly assessing how to handle levee mapping issues, we have generated the below flowchart.

cc: See Distribution List

Distribution List (electronic distribution only):

Office of the Mitigation Division Director
Risk Assessment Branch
Risk Identification Branch
Flood Insurance and Mitigation Divisions in FEMA Regional Offices
Office of Legislative Affairs
Office of General Counsel
National Service Provider
Systems Engineering and Technical Assistance Contractor
Map Service Center



Note: Numbers shown for reference purposes only

* Indicates community coordination point

U.S. Department of Homeland Security
500 C Street, SW
Washington, DC 20472

FEMA

March 16, 2007
(Originally Issued on September 25, 2006)

MEMORANDUM FOR: Mitigation Division Directors
Regions I - X

FROM: David I. Maurstad
Director
Mitigation Division

SUBJECT: Revised Procedure Memorandum No. 43 - Guidelines for Identifying Provisionally Accredited Levees

Background: Early in the implementation of Flood Map Modernization (Map Mod), the Department of Homeland Security's Federal Emergency Management Agency (FEMA) recognized that the role of levees in flood risk reduction would be an important part of the efforts of Map Mod. Further, it was acknowledged that the condition of levees had not been assessed since they were originally mapped as providing base (1-percent-annual-chance) flood protection. Because of this, FEMA initiated a revised process to gain a better understanding of the actual flood risks for those citizens living and working behind levees nationwide.

On August 22, 2005, FEMA issued Procedure Memorandum No. 34 - Interim Guidance for Studies Including Levees. The purpose of the memorandum was to help clarify the responsibility of community officials or other parties seeking recognition of a levee by providing information identified during a study/mapping project. Often, documentation regarding levee design, accreditation, and the impacts on flood hazard mapping is outdated or missing altogether. To remedy this, Procedure Memorandum No. 34 provides interim guidance on procedures to minimize delays in near-term studies/mapping projects, to help our mapping partners properly assess how to handle levee mapping issues.

Issue: Levee owners or communities have the responsibility to provide documentation that a levee meets the requirements of Title 44 of the Code of Federal Regulations, Section 65.10 of the National Flood Insurance Program regulations (44 CFR Section 65.10), as part of a study/mapping project. Without the required documentation necessary to comply with 44 CFR Section 65.10, the area behind the levee will be re-delineated and mapped as Special Flood Hazard Area on the Digital Flood Insurance Rate Map (DFIRM). Procedure Memorandum No. 34 allows for the issuance of a deadline to the community for submitting the required documentation.

While 44 CFR Section 65.10 documentation is being compiled, the release of more up-to-date DFIRM panels for other parts of a community or county may be delayed. To minimize the impact on the Map Mod goals of mapping areas landward of levees, mapping partners should be provided with guidance that will allow preliminary and effective DFIRMs to be issued while the levee owner or community is given a reasonable amount of time to compile and submit data and documentation to show compliance with the requirements of 44 CFR Section 65.10. Guidance should also be provided to the mapping partners that allows, in specific situations, the preliminary DFIRM to be issued while providing the communities and levee owners with a specified timeframe to show compliance with 44 CFR Section 65.10 by correcting any maintenance deficiencies associated with the levee.

Action Taken: To minimize the impact of the levee recognition and certification process on Map Mod goals, guidelines have been developed that will allow mapping partners to issue preliminary and effective versions of DFIRMs while the levee owners or communities are compiling the full documentation required to show compliance with 44 CFR Section 65.10. The guidelines also explain that mapping partners can issue preliminary DFIRMs while providing the communities and levee owners with a specified timeframe to correct any maintenance deficiencies associated with a levee to and show compliance with 44 CFR Section 65.10. These guidelines are summarized in the attached document entitled "Guidelines for Identifying Provisionally Accredited Levees (PALs)."

The attached document describes the criteria for five scenarios intended to determine when a levee does or does not qualify for the PAL designation. FEMA has established a specified timeframe in which the community or levee owner may use to fulfill the remaining requirements for 44 CFR Section 65.10 before the levee is shown on the DFIRM as not providing base flood protection. The attached guidance also describes an additional process for maintenance deficient levees that do not currently qualify for the PAL designation. FEMA has established a separate specified timeframe for these levees, which allows the community or levee owner time to correct any maintenance deficiencies associated with a levee. If the levee qualifies for the PAL designation, FEMA will provide the community 90 days to sign and return an agreement indicating that the full documentation for 44 CFR Section 65.10 will be provided within 24 months of the signed agreement. If the signed agreement is not returned to FEMA within 90 days, or if the levee does not meet the PAL requirements (except for the maintenance deficient levees), the community is no longer eligible for the PAL designation, and the area landward of the levee will be remapped as Zone AE or Zone A, depending on the type of study performed for the area.

For levees that are included in the U.S. Army Corps of Engineers (USACE) Federal Program, FEMA will actively coordinate with the appropriate USACE district to determine which projects do not provide protection from the base flood. In a collaborative effort, existing data or project-specific information will be evaluated to identify and validate non-accredited levees in the USACE's inventory. As part of the USACE's recent survey of their levee inventory, levee projects have been identified to be no longer eligible for Public Law (PL) 84-99 rehabilitation assistance, based on the project's last inspection. However, many of these levee projects have been identified to

be eligible for a one-time-only "maintenance deficiency correction period," established to allow public sponsors/levee owners to correct levee maintenance deficiencies before the levee is placed in an inactive status in the USACE Rehabilitation & Inspection Program and becomes ineligible for PL 84-99 rehabilitation assistance. The USACE has developed a written notification process to inform communities or levee owners of this status after it has coordinated with FEMA. Copies of the USACE notification letter will be provided to FEMA. If a community or levee owner receives this notification letter, the area landward of the identified levee will be mapped as Zone AE or Zone A, as appropriate.

Effective on the date of this Procedure Memorandum, levees that meet the PAL requirement (levees presently shown as providing base flood protection on the effective FIRM), for which the community or levee owner cannot readily provide full documentation of 44 CFR Section 65.10, will be identified on the FIRM with a map note. This note, placed landward of the levee, will indicate that the levee is provisionally accredited and any existing Zone X (shaded) area is provisional. If there is no existing Zone X (shaded) area on the effective FIRM, then the mapping partner should define the provisional Zone X (shaded) area using the best available data. Specific procedures and guidance for evaluating and mapping levees is provided in Appendix H of *Guidelines and Specifications for Flood Hazard Mapping Partners.*

The following note must be applied at several locations, point to the levee, and be placed landward of the levee in or near the Zone X (shaded) area:

> WARNING: Provisionally Accredited Levee. For explanation, see the Notes to Users.

The applicable Note to Users would read as follows:

> WARNING: This levee, dike, or other structure has been provisionally accredited and mapped as providing protection from the 1-percent-annual-chance flood. To maintain accreditation, the levee owner or community is required to submit documentation necessary to comply with 44 CFR Section 65.10 by (_____,____). Because of the risk of overtopping or failure of the structure, communities should take proper precautions to protect lives and minimize damages in these areas, such as issuing an evacuation plan and encouraging property owners to purchase flood insurance.

The five scenarios for determining whether the levee qualifies for the PAL designation are described in the attachment. The document also summarizes the process for coordinating with community officials and others to acquire the appropriate levee documentation, while moving forward with the production of countywide mapping for communities with levees.

Attachment

Guidelines for Identifying Provisionally Accredited Levees (PALs)

cc: See Distribution List

Distribution List (electronic distribution only):

Directors, Regions I - X

Office of the Mitigation Division Director

Risk Analysis Branch

Risk Reduction Branch

Risk Insurance Branch

Federal Insurance and Mitigation Divisions in FEMA Regional Offices

Office of Legislative Affairs

Office of General Counsel

National Service Provider

Independent Verification and Validation Contractor

Map Service Center

Indefinite Delivery Indefinite Quantity Contractors

Cooperating Technical Partners

LEVEES
IDENTIFYING THE RISK

Provisionally Accredited Levees

Mapping Scenarios for Procedure Memorandum No. 43

The Department of Homeland Security, Federal Emergency Management Agency (FEMA), has implemented procedures to verify that levees currently depicted on effective National Flood Insurance Program (NFIP) flood maps as providing protection from the 1-percent-annual-chance flood continue to meet the current NFIP levee criteria. As part of its Flood Map Modernization effort, FEMA has issued two Procedure Memorandums—Procedure Memorandum No. 34 (PM 34) and Procedure Memorandum No. 43 (PM 43)—to clarify the evaluation and mapping requirements for areas protected by levees. You may view these memorandums on FEMA's Web site at www.fema.gov/plan/prevent/fhm/lv_fpm.shtm.

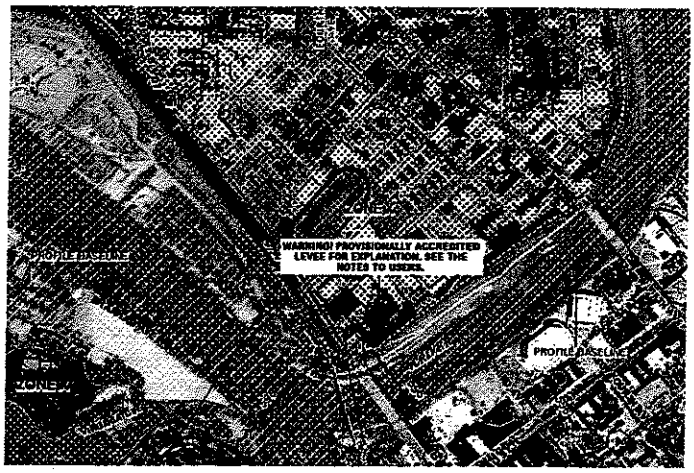
PM 34—*Interim Guidance for Studies Including Levees*— issued on August 22, 2005, helps clarify the responsibility of community officials or other parties seeking recognition of a levee in providing information on levees identified during a study/mapping project. PM 34 clarifies procedures to minimize delays in near-term study/mapping projects and to aid FEMA mapping partners in properly assessing how to handle levee mapping issues.

PM 43—*Guidelines for Identifying Provisionally Accredited Levees*— issued as revised on March 16, 2007, describes five scenarios for determining whether a previously accredited levee—that is, a levee that has been shown on an NFIP map as providing 1-percent-annual-chance flood protection—does or does not qualify to be a Provisionally Accredited Levee, or PAL. The PAL designation allows communities or levee owners with additional time to compile and submit the data and documentation required to comply with NFIP regulations.

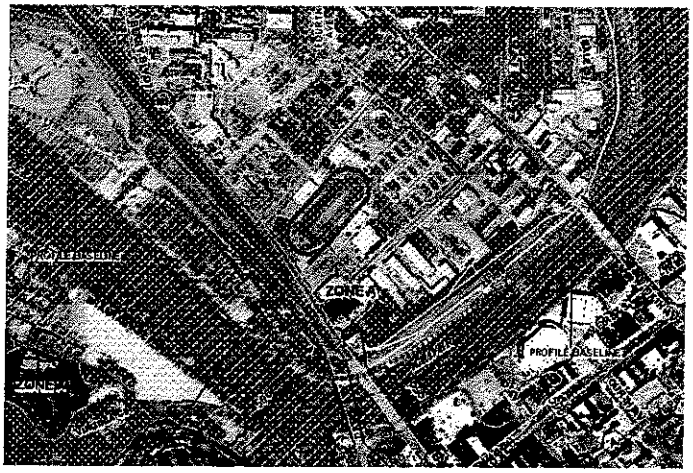
Before FEMA will designate a levee as a PAL, the community or levee owner will need to sign and return an agreement that indicates the data and documentation required for compliance with Title 44, Chapter 1, Section 65.10 of the Code of Federal Regulations (44 CFR Section 65.10) will be provided within a specified timeframe depending on the levee's status (i.e., within 24 months of the 91st day following the initial notification letter date or within 24 months of the final day of the correction period for levees that have been offered the 1-year maintenance deficiency correction period). If the signed agreement or a letter requesting a 1-year maintenance deficiency correction period is not returned to FEMA within 90 days, levees in the community are no longer eligible for the PAL designation. Levees that have been offered the 1-year maintenance deficiency correction period have a 1-year period to correct the maintenance deficiencies as well as request and be approved for the PAL designation. If the levee does not meet the PAL requirements, the area landward of the levee will be remapped as Zone AE or Zone A depending on the type of study performed for the area. Additional information on the various PAL scenarios is provided on the following page.

FEMA's mapping requirements are designed to provide the people living and working behind the levee with appropriate risk information so that they may minimize damage and loss of life. The regulatory requirements for FEMA to recognize levees are found in 44 CFR Section 65.10, which you may view on FEMA's Web site at www.fema.gov/plan/prevent/fhm/lv_intro.shtm. PMs 34 and 43 were issued as clarification of the requirements in Appendix H of *Guidelines and Specifications for Flood Hazard Mapping Partners*.

It is also important to note that levees are designed to provide a *specific level of protection*. They can be overtopped or even fail in larger flood events. Everyone should understand the risk to life and property that resides behind levees—risk that even the best flood-control system cannot completely eliminate.



Digital Flood Insurance Rate Map (DFIRM) with PAL Designation



DFIRM with De-Accredited or Levee Not Accredited

The table below shows the possible scenarios outlined in PM 43.

Scenario	Criteria	PAL Eligible	USACE Program	Current Map Shows Protection is Provided	Maintenance Deficiency Period	Who Notifies Levee Owner/ Community/ Local Project Sponsor
A1	• Levees not in USACE Program • Shown on effective FIRM as providing 1-percent-annual-chance flood protection • Community/levee owner believes levee meets 44 CFR Section 65.10 requirements	Yes	No	Yes	No	FEMA Regional Office
A2	• Levees not in USACE Program • Shown on effective FIRM as providing 1-percent-annual-chance flood protection • The community/levee owner believes levee meets 44 CFR Section 65.10 requirements except for maintenance deficiencies	Yes	No	Yes	Yes	FEMA Regional Office

Scenario	Criteria	PAL Eligible	USACE Program	Current Map Shows Protection is Provided	Maintenance Deficiency Period	Who Notifies Levee Owner/ Community/ Local Project Sponsor
B	• Levees in USACE Program • Shown on effective FIRM as providing 1-percent-annual-chance flood protection • No available information indicates levee does not provide 1-percent-annual-chance flood protection • The project inspection rating is within an acceptable range (as defined by USACE)	Yes	Yes	Yes	No	FEMA Regional Office
C1	• Levees in USACE Program • Shown on effective FIRM as providing 1-percent-annual-chance flood protection • USACE has determined that levee's recent inspection ratings are listed as fair, poor, or unacceptable • USACE has determined that the project status in the USACE Program has been switched from active to inactive • USACE has not provided a 1-year maintenance deficiency correction period	No	Yes	Yes	No	USACE, FEMA Regional Office

Scenario	Criteria	PAL Eligible	USACE Program	Current Map Shows Protection is Provided	Maintenance Deficiency Period	Who Notifies Levee Owner/ Community/ Local Project Sponsor
C2	• Levees in USACE Program • Shown on effective FIRM as providing 1-percent-annual-chance flood protection • USACE has determined that levee's recent inspection ratings are listed as fair, poor, or unacceptable • Levee was in active status in USACE Program before 9/30/2005 (FY06) • USACE offered a one-time-only, 1-year "maintenance deficiency correction period"	Yes	Yes	Yes	Yes	USACE, FEMA Regional Office
D	• Levees in USACE Program • Not shown as providing 1-percent-annual-chance flood protection on FIRM	No	Yes	No	No	—
E	• Levees in USACE Program • Shown as providing protection but does not provide an adequate level (1-percent-annual-chance or greater) of flood protection as determined by USACE in coordination with FEMA • Levee inspection rating NOT listed as fair, poor, or unacceptable, but levee may have failed or experienced overtopping by flood event less than 1-percent-annual-chance flood	No	Yes	Yes	No	FEMA Regional Office

LEVEES
IDENTIFYING THE RISK

Provisionally Accredited Levees

Answers to Questions about Procedure Memorandum No. 43

Providing communities with up-to-date, accurate, and reliable flood hazard and risk information on Digital Flood Insurance Rate Maps (DFIRMs) is one of the primary goals of the Federal Emergency Management Agency's (FEMA's) Flood Map Modernization (Map Mod) effort. For more than one quarter of the counties for which new or updated DFIRMs will be produced under Map Mod, levees are shown on the effective flood maps as providing flood protection. Therefore, as part of Map Mod, FEMA reviewed its existing guidance regarding the submittal of the data and documentation required to meet current National Flood Insurance Program (NFIP) levee criteria and the mapping of levee-affected areas to reflect the protection provided by the levees. As a result of this review, FEMA has issued two Procedure Memorandums to clarify the evaluation and mapping requirements for areas protected by levees. The questions and answers below are provided to further explain these requirements.

Q: What is a levee?

A: A levee is a manmade structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

It is important to note that levees are designed to provide a *specific level of protection.* They can be overtopped or fail in larger flood events. They require regular maintenance and periodic upgrades to retain their level of protection. When levees do fail, they fail catastrophically, and the damage may be more significant than if the levee was not there. Everyone should understand the risk to life and property that resides behind levees—risk that even the best flood-control system can not completely eliminate. For all these reasons, FEMA encourages people to understand their risk.

Q: What regulations apply to mapping areas protected by levee systems?

A: The regulatory requirements of the NFIP are cited at Title 44, Chapter 1, Section 65.10, of the Code of Federal Regulations (44 CFR Section 65.10). According to 44 CFR Section 65.10, it is the community, levee owner, and/or local project sponsor's responsibility to submit the data and documentation showing that the levee system complies with these requirements, including the development and maintenance of an operation and maintenance plan. You may view 44 CFR Section 65.10 on FEMA's Web site at www.fema.gov/plan/prevent/fhm/lv_fpm.shtm.

Q: What are the requirements for evaluating and mapping areas behind levees?

A: FEMA has issued two Procedure Memorandums that provide guidance for mapping areas behind levees—Procedure Memorandum No. 34 (PM 34) —*Interim Guidance for Studies Including Levees* and Procedure Memorandum No. 43 (PM 43)—*Guidelines for Identifying Provisionally Accredited Levees*—as clarification to Appendix H of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners.* PM 43 describes the various PAL scenarios and how each may be mapped. You may view these Procedure Memorandums on FEMA's Web site at www.fema.gov/plan/prevent/fhm/lv_fpm.shtm.

Q: Who is responsible for complying with 44 CFR Section 65.10 of the NFIP regulations?

A: Compliance with 44 CFR Section 65.10 requirements rests with communities, levee owners, and/or local project sponsors—not FEMA. A levee owner can be a Federal or State agency, a water management or flood control district, a local community, a levee district, a non-public organization, or an individual. The party responsible for operating and maintaining the levee must be a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP. FEMA's responsibility is solely to review the information provided and

either accredit the levee with providing 1-percent-annual-chance flood protection on the DFIRM or, when the levee is shown to be inadequate, to reflect the increased risk of flooding behind that levee to the community and the public.

Q: What is PM 34 and why was it issued?

A: Documentation regarding levee design, structural integrity, and other requirements for accrediting a levee with providing 1-percent-annual-chance flood protection often is outdated or missing altogether. To help clarify the entities responsible for providing information on levees identified during a mapping project, FEMA issued PM 34—*Interim Guidance for Studies Including Levees*— on August 22, 2005.

PM 34 clarifies that it is the levee owner or community's responsibility to provide documentation that the levee meets the requirements of 44 CFR Section 65.10 as part of a study/mapping project. In addition, PM 34 provides clarification on procedures to minimize delays in near-term study/mapping projects and to aid mapping partners in properly assessing how to handle levee mapping issues. You may view PM 34 and 44 CFR Section 65.10 on FEMA's Web site at www.fema.gov/plan/prevent/fhm/lv_fpm.shtm.

Q: What is PM 43 and why was it issued?

A: FEMA originally issued PM 43—*Guidelines for Identifying Provisionally Accredited Levees*—on September 25, 2006. PM 43 provides guidance to mapping contractors and partners on issuing preliminary and, in some cases, effective flood maps while providing communities and levee owners additional time to compile and submit the documentation necessary to demonstrate compliance with 44 CFR Section 65.10. On March 16, 2007, PM 43 was revised to include guidance on evaluating levees that are maintenance deficient and to offer a one-time-only "maintenance deficiency correction period."

Q: What is a Provisionally Accredited Levee?

A: A levee that FEMA has previously accredited with providing 1-percent-annual-chance protection on an effective flood map, and for which FEMA is awaiting data and/or documentation that will demonstrate the levee's compliance with 44 CFR Section 65.10 of the NFIP regulations. A PAL is shown on a flood map as providing 1-percent-annual-chance flood protection, and the area landward of the levee is shown as Zone X (shaded) except for areas of residual flooding, such as ponding areas, which will be shown as a Special Flood Hazard Area.

Q: What if a levee meets the PAL requirements of PM 43?

A: For levees that meet the PAL requirement (levees presently shown as providing 1-percent-annual-chance flood protection on the effective flood map) and for which the community or levee owner cannot readily provide the full data and documentation required by 44 CFR Section 65.10, a note will be placed on the map panel landward of the levee to indicate the levee is provisionally accredited and the designation of any existing Zone X (shaded) area is provisional.

Before FEMA will designate a levee as a PAL, the community or levee owner will need to sign and return an agreement. By signing the agreement, the levee owner/community indicates the levee currently complies with the requirements of 44 CFR Section 65.10 and that the data and documentation required for compliance with 44 CFR Section 65.10 will be provided within a specified timeframe depending on the levee's status (i.e., within 24 months of the 91st day following the date of the initial notification letter or within 24 months of the final day of the correction period for levees that have been offered the 1-year maintenance deficiency correction period).

Q: How will a PAL be identified on a DFIRM?

A: To identify the PAL, the following note will be applied at several locations, point to the levee, and be placed landward of the levee on the flood map in or near the Zone X (shaded) area:

> WARNING: Provisionally Accredited Levee. For explanation, see the Notes to Users.

The following note will be added to the Notes to Users:

> WARNING: This levee, dike, or other structure has been provisionally accredited and mapped as providing protection from the 1-percent-annual-chance flood. To maintain accreditation, the levee owner or community is required to submit documentation necessary to comply with 44 CFR Section 65.10 by (_____,____). Because of the risk of overtopping or failure of the structure, communities should take proper precautions to protect lives and minimize damages in these areas, such as issuing an evacuation plan and encouraging property owners to purchase flood insurance.

Q: How does FEMA determine if a levee meets the PAL requirements of PM 43?

A: For a levee to be eligible for PAL designation, the levee must be presently shown as providing protection from the 1-percent-annual-chance flood on the effective flood map. Additional PAL requirements include the submittal of a PAL application package and a 12-month progress report. If applicable, there are other potential requirements, including a letter requesting a maintenance deficiency correction period and submittal of data demonstrating that maintenance deficiencies have been corrected (as appropriate), a 12-month progress report. Specific timeframes for these requirements vary depending upon the levee's status – however, more detailed information can be found in the guidance document entitled, "Guidelines for Identifying Provisionally Accredited Levees (PAL)." This document contains descriptions of different mapping scenarios and is available on FEMA's Web site at www.fema.gov/plan/prevent/fhm/lv_fpm.shtm.

For levees in the USACE Program that are shown on the effective flood map as providing 1-percent-annual-chance flood protection but have known deficiencies, FEMA will coordinate with the appropriate USACE district to determine if the USACE will offer the one-time-only, 1-year maintenance deficiency period.

Q: What if a levee qualifies for the maintenance deficiency correction period as specified in PM 43?

A: For levees not in the USACE Program, if the community/levee owner believes that the levee meets 44 CFR Section 65.10 requirements with the exception of maintenance deficiencies, then they may qualify for a one-time-only 1-year maintenance deficiency correction period. The community/levee owner will have 90 days from the date of the initial notification letter to submit a signed letter requesting the maintenance deficiency correction period.

The community/levee then has 1 year to submit 44 CFR Section 65.10 documentation or a completed PAL application package (if additional time is needed to compile 44 CFR Section 65.10 documentation) to show the levee as accredited. If the community/levee owner does not provide 44 CFR Section 65.10 documentation or a completed PAL application within the 1-year period, then FEMA will issue an effective DFIRM showing the area landward of the levee as Zone AE or Zone A, depending upon the type of study performed for the area.

The USACE determines whether a levee in the USACE Program will be offered a one-time-only, 1-year maintenance deficiency correction period. If the levee is not offered the correction period, the levee will be de-accredited and the area landward of the levee will be remapped and shown as Zone AE or Zone A, depending upon the type of study performed for the area. If the levee is offered the correction period, the community/levee owner has one-year to either submit data and documentation for 44 CFR Section 65.10 compliance or request and be approved for PAL designation (if additional time is needed). If neither is received, then the levee will be de-accredited and FEMA will issue an effective DFIRM showing the area landward of the levee as Zone AE or Zone A, depending upon the type of study performed for the area.

Q: What qualifies as a USACE Program levee?
A: Levees within the USACE Program are defined to include the following:

- Levees built by the USACE that were authorized for construction by the U.S. Congress or by USACE continuing authorities (e.g., Section 205);
- Levee projects constructed by non-Federal interests or other (non-USACE) Federal agencies and incorporated into the USACE Federal system by specific congressional action;
- Federal projects that are either operated and maintained by the USACE or turned over to a local sponsor for operation and maintenance; and Non-Federal projects within the Rehabilitation and Inspection Program (RIP), Public Law 84-99;

Q: What qualifies as a Non-USACE Program Levee?
A: Non-Federal levees are defined to include the following:

- Levees not authorized by the U.S. Congress or other Federal agency authority;
- Levees built by other Federal agencies and not incorporated into the USACE Federal system;
- Locally built and maintained levees built by a local community; and
- Privately built by a nonpublic organization or individuals and maintained by a local community.

Q: Will adhering to PM 43 delay the release of new DFIRMs?
A: The PM 43 process allows FEMA to issue the preliminary and effective DFIRMs while providing communities and levee owners a specified timeframe to submit the documentation necessary to show compliance with 44 CFR Section 65.10. For levees with maintenance deficiencies (that are otherwise believed to comply with the requirements of 44 CFR Section 65.10), the release of new DFIRMs may be delayed up to one year to provide the community/levee owner with additional time to correct these deficiencies.

It is important that community officials and citizens have the most accurate and up-to-date information to make decisions based on the flood risk that exists in areas behind levees. PM 43 allows for community officials and the public to have the most current flood hazard and risk information while the community or levee owners are given a reasonable amount of time to compile and submit data and documentation to show compliance with the requirements of 44 CFR Section 65.10.

Region IX PAL Levee Designations

Type	Description	Distribution *
A	For communities/levee owners with A only levee(s). The letter described the A1 and A2 options for communities/levee owners to decide which is appropriate. All RIX non-Federal levees were offered PAL status unless it was known that the was not certifiable or not planned to be certified/accredited.	Mailed to Community with CC to levee owner (if known), state NFIP Coord. and Cong. offices
B	For communities/levee owners that only have B levees	Mailed to Community with CC to levee owner, state NFIP Coord. and Cong. offices
A-B	For communities/levee owners that have both A and B levees	Mailed to Community with CC to levee owner, state NFIP Coord. and Cong. offices
C2	For levee owners with a C2 levee, as identified in a USACE letter that granted the 1-year maintenance deficiency correction period	Mailed to levee owner with CC to Com-munity, state NFIP Coord. & Cong. offices
A-B-C2	For communities/levee owners with A, B and C2 levees. This was essentially an A-B PAL letter with a notification that a separate C2 letter would be sent to the C2 levee owner	Mailed to Community with CC to levee owner, state NFIP Coord. and Cong. offices
E	For communities/levee owners that have a Scenario E levees(s). These have not yet been mailed for all Scenario E levees.	Mailed to levee owner with CC to Community, state NFIP Coord. and Cong. offices

* Mailed to addressees via certified, return-receipt-required and to the CC recipients via regular mail

FACT SHEET

LEVEES
IDENTIFYING THE RISK

Requirements of 44 CFR Section 65.10:
Mapping of Areas Protected by Levee Systems

As part of a mapping project, it is the levee owner's or community's responsibility to provide data and documentation to show that a levee meets the requirements of Section 65.10 of the National Flood Insurance Program (NFIP) regulations. Links to Section 65.10 and many other documents are available on FEMA's Web site at www.fema.gov/plan/prevent/fhm/lv_fpm.shtm.

The FEMA requirements in Section 65.10 are separated into five categories:

1. General criteria;
2. Design criteria;
3. Operations plans and criteria;
4. Maintenance plans and criteria; and
5. Certification requirements.

The requirements for each of these areas are summarized below.

(A) GENERAL CRITERIA

For purposes of the NFIP, FEMA will only recognize in its flood hazard and risk mapping effort those levee systems that meet, and continue to meet, minimum design, operation, and maintenance standards that are consistent with the level of protection sought through the comprehensive floodplain management criteria established by Section 60.3 of the NFIP regulations. Section 65.10 of the NFIP regulations describes the types of information FEMA needs to recognize, on NFIP maps, that a levee system provides protection from the flood that has a 1-percent chance of being equaled or exceeded in any give year (base flood). This information must be supplied to FEMA by the community or other party seeking recognition of a levee system at the time a study or restudy is conducted, when a map revision under the provisions of Part 65 of the NFIP regulations is sought based on a levee system, and upon request by the Administrator during the review of previously recognized structures. The FEMA review is for the sole purpose of establishing appropriate risk zone determinations for NFIP maps and does not constitute a determination by FEMA as to how a structure or system will perform in a flood event.

(B) DESIGN CRITERIA

For the purposes of the NFIP, FEMA has established levee design criteria for freeboard, closures, embankment protection, embankment and foundation stability, settlement, interior drainage, and other design criteria. These criteria are summarized in subsections below.

(B)(1) FREEBOARD

For riverine levees:

- A minimum freeboard of 3 feet above the water-surface level of the base flood must be provided.
- An additional 1 foot above the minimum is required within 100 feet on either side of structures (e.g., bridges) riverward of the levee or wherever the flow is constricted.

- An additional 0.5 foot above the minimum at the upstream end of the levee, tapering to not less than the minimum at the downstream end of the levee, is also required.

Exceptions to the minimum riverine freeboard requirements above may be approved if the following criteria are met:

- Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted.
- The material presented must evaluate the uncertainty in the estimated base flood elevation profile and include, but not necessarily be limited to:
    - An assessment of statistical confidence limits of the 1-percent-annual-chance discharge;
    - Changes in stage-discharge relationships; and
    - Sources, potential, and magnitude of debris, sediment, and ice accumulation.
- It must be also shown that the levee will remain structurally stable during the base flood when such additional loading considerations are imposed.

Under no circumstances will freeboard of less than 2 feet be accepted.

For coastal levees, the freeboard must be established at 1 foot above the height of the 1-percent-annual-chance wave or the maximum wave runup (whichever is greater) associated with the 1-percent-annual-chance stillwater surge elevation at the site.

Exceptions to the minimum coastal freeboard requirements above may be approved if the following criteria are met:

- Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted.
- The material presented must evaluate the uncertainty in the estimated base flood loading conditions. Particular emphasis must be placed on the effects of wave attack and overtopping on the stability of the levee.

Under no circumstances will a freeboard of less than 2 feet above the 1-percent-annual-chance stillwater surge elevation be accepted.

(B)(2) CLOSURES

The levee closure requirement is that all openings must be provided with closure devices that are structural parts of the system during operation and design according to sound engineering practice.

(B)(3) EMBANKMENT PROTECTION

Engineering analyses must be submitted to demonstrate that no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of the seepage path and subsequent instability.

The factors to be addressed in such analyses include, but are not limited to:

- Expected flow velocities (especially in constricted areas);
- Expected wind and wave action;

- Ice loading;
- Impact of debris;
- Slope protection techniques;
- Duration of flooding at various stages and velocities;
- Embankment and foundation materials;
- Levee alignment, bends, and transitions; and
- Levee side slopes.

(B)(4) EMBANKMENT AND FOUNDATION STABILITY

Engineering analyses that evaluate levee embankment stability must be submitted.

The analyses provided shall evaluate expected seepage during loading conditions associated with the base flood and shall demonstrate that seepage into or through the levee foundation and embankment will not jeopardize embankment or foundation stability.

An alternative analysis demonstrating that the levee is designed and constructed for stability against loading conditions for Case IV as defined in U.S. Army Corps of Engineers (USACE) Engineering Manual 1110-2-1913, Chapter 6, Section II, may be used.

The factors that shall be addressed in the analyses include:

- Depth of flooding;
- Duration of flooding;
- Embankment geometry and length of seepage path at critical locations;
- Embankment and foundation materials;
- Embankment compaction;
- Penetrations;
- Other design factors affecting seepage (e.g., drainage layers); and
- Other design factors affecting embankment and foundation stability (e.g., berms).

(B)(5) SETTLEMENT

Engineering analyses must be submitted that assess the potential and magnitude of future losses of freeboard as a result of levee settlement and demonstrate that freeboard will be maintained within the minimum freeboard standards set forth in B(1).

This analysis must address:

- Embankment loads,
- Compressibility of embankment soils,
- Compressibility of foundation soils,

- Age of the levee system, and
- Construction compaction methods.

A detailed settlement analysis using procedures such as those described in USACE Engineering Manual EM 1100-2-1904 must be submitted.

(B)(6) INTERIOR DRAINAGE

An analysis must be submitted that identifies the source(s) of such flooding; the extent of the flooded area; and, if the average depth is greater than 1 foot, the water-surface elevation(s) of the base flood. This analysis must be based on the joint probability of interior and exterior flooding and the capacity of facilities (such as drainage lines and pumps) for evacuating interior floodwaters. Interior drainage systems usually include storage areas, gravity outlets, pumping stations, or a combination thereof.

For areas of interior drainage that have average depths greater than 1 foot, mapping must be provided depicting the extents of the interior flooding, along with supporting documentation.

(B)(7) OTHER DESIGN CRITERIA

In unique situations, such as those where the levee system has relatively high vulnerability, FEMA may require that other design criteria and analyses be submitted to show that the levees provide adequate protection. In such situations, sound engineering practice will be the standard on which FEMA will base its determinations. FEMA also will provide the rationale for requiring this additional information.

(C) OPERATIONS PLANS AND CRITERIA

For a levee system to be recognized, the operational criteria must be as described below. All closure devices or mechanical systems for internal drainage, whether manual or automatic, must be operated in accordance with an officially adopted operation manual, a copy of which must be provided to FEMA by the operator when levee or drainage system recognition is being sought or when the manual for a previously recognized system is revised in any manner. All operations must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP.

(C)(1) CLOSURES

Operation plans for closures must include the following:

- Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists for the completed operation of all closure structures, including necessary sealing, before floodwaters reach the base of the closure;
- A formal plan of operation, including specific actions and assignments of responsibility by individual name or title; and
- Provisions for periodic operation, at not less than 1-year intervals, of the closure structure(s) for testing and training purposes.

(C)(2) INTERIOR DRAINAGE SYSTEMS

Interior drainage systems associated with levee systems usually include storage areas, gravity outlets, pumping stations, or a combination thereof. FEMA will recognize these drainage systems on NFIP maps for flood protection purposes only if the following minimum criteria are included in the operation plan:

- Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists to permit activation of mechanized portions of the drainage system;
- A formal plan of operation, including specific actions and assignments of responsibility by individual name or title;
- Provision for manual backup for the activation of automatic systems; and
- Provisions for periodic inspection of interior drainage systems and periodic operation of any mechanized portions for testing and training purposes; no more than 1 year shall elapse between either the inspections or the operations.

(C)(3) OTHER OPERATION PLANS AND CRITERIA

FEMA may require other operating plans and criteria to ensure that adequate protection is provided in specific situations. In such cases, sound emergency management practice will be the standard upon which FEMA determinations will be based.

(D) MAINTENANCE PLANS AND CRITERIA

For levee systems to be recognized as providing protection from the base flood, the following maintenance criteria must be met:

- Levee systems must be maintained in accordance with an officially adopted maintenance plan, and a copy of this plan must be provided to FEMA by the owner of the levee system when recognition is being sought or when the plan for a previously recognized system is revised in any manner.
- All maintenance activities must be under the jurisdiction of a(n):
    - Federal or State agency;
    - Agency created by Federal or State law; or
    - Agency of a community participating in the NFIP that must assume ultimate responsibility for maintenance.
- The maintenance plan must document the formal procedure that ensures that the stability, height, and overall integrity of the levee and its associated structures and systems are maintained.
- At a minimum, the maintenance plan shall specify:
    - Maintenance activities to be performed;
    - Frequency of their performance; and
    - Person by name or title responsible for their performance.

(E) CERTIFICATION REQUIREMENTS

Data submitted to support that a given levee system complies with the structural requirements set forth in B(1) through B(7) above must be certified by a Registered Professional Engineer. Also, certified as-built plans of the levee must be submitted. Certifications are subject to the definition given in Section 65.2 of the NFIP regulations. In lieu of these structural requirements, a Federal agency with responsibility for levee design may certify that the levee has been adequately designed and constructed to provide protection against the base flood.

FACT SHEET

LEVEES
IDENTIFYING THE RISK

Meeting the Criteria for Accrediting Levees on Flood Maps

How-to-Guide for Floodplain Managers and Engineers

A levee is a manmade structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding. Levees include floodwalls and other flood-control structures (not including dams).

As part of the countywide flood mapping process, the Department of Homeland Security, Federal Emergency Management Agency (FEMA) and its State and local mapping partners need to review data associated with levees.

It is the levee owner's or community's responsibility to provide data and documentation to demonstrate that a levee meets the requirements of the National Flood Insurance Program (NFIP) as described in Title 44, Chapter 1, Section 65.10 of the Code of Federal Regulations (44 CFR Section 65.10) which you may view on FEMA's Web site at www.fema.gov/plan/ prevent/ fhm/lv_fpm.shtm.

To be recognized as providing protection from the 1-percent-annual-chance flood on Flood Insurance Rate Maps (FIRMs), levee systems must meet *and continue to meet* the minimum design, operation, and maintenance standards of 44 CFR Section 65.10 of the NFIP regulations.

To help clarify the responsibilities of community officials, levee owners, or other parties seeking recognition of a levee for providing information on levees identified during a mapping project, FEMA issued Procedure Memorandum No. 34 (PM 34), *Interim Guidance for Studies Including Levees*, on August 22, 2005. PM 34 provided clarification of the existing procedures, which were provided in Appendix H of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*.

FEMA issued Revised Procedure Memorandum No. 43, *Guidelines for Identifying Provisionally Accredited Levees*, on March 16, 2007, which will allow mapping contractors and partners to issue preliminary and, in some cases, effective flood maps while communities and levee owners are compiling and submitting the full documentation necessary to show compliance with 44 CFR Section 65.10 requirements.

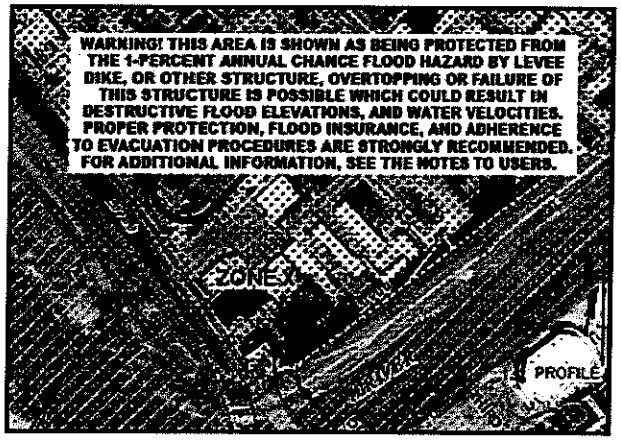
This document provides information regarding what types of information you'll need to submit during the mapping process for your levee to be recognized as providing protection on FIRMs, including a checklist and an index of further resources you may wish to consult.

COMMUNITIES WITH LEVEES SHOULD KNOW:

- The participating community and/or other party seeking recognition or continued recognition must provide sufficient data showing that the levee provides protection from the 1-percent-annual-chance flood (also known as the base flood) for FEMA to recognize the levee on a FIRM.
- Communities *must* actively participate in the levee documentation process.
- Levees structures without sufficient documentation will not be credited as providing flood protection.
- Some levees may qualify to be shown as Provisionally Accredited Levees on the FIRM. Guidance regarding Provisionally Accredited Levees is available at www.fema.gov/plan/ prevent/fhm/lv_fpm. shtm.

HOW WILL FEMA MAP LEVEES?

FEMA's mapping requirements are designed to provide the people living and working behind the levee with appropriate risk information so that they may minimize damage and loss of life. It is important to note that FEMA does not evaluate the performance of a levee—this is the responsibility of the levee owner. FEMA is responsible for establishing mapping standards and risk determination zones and reflecting these determinations on flood maps.

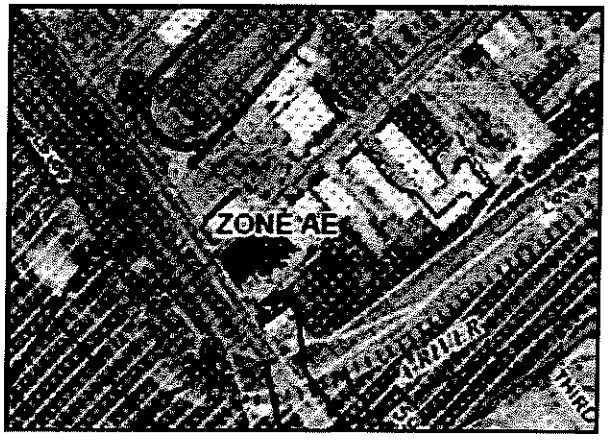


Levee Accredited on FIRM

An accredited levee is a levee that FEMA shows on a FIRM as providing protection from the 1-percent-annual-chance or greater flood. This determination is based on the submittal of data and documentation as required by the NFIP regulations. The area landward of an accredited levee is shown as Zone X (shaded) on the FIRM except for areas of residual flooding, such as ponding areas, which will be shown as Special Flood Hazard Area. Flood insurance is not mandatory in Zone X (shaded); however, it is strongly encouraged for all structures in areas behind levees.

Provisionally Accredited Levee (PAL)

A PAL is a designation for a levee that FEMA has previously accredited with providing 1-percent-annual-chance flood protection on an effective FIRM, and for which FEMA is awaiting data and/or documentation that will show the levee's compliance with NFIP regulations. Before FEMA will designate a levee as a PAL, the community or levee owner will need to sign and return an agreement that indicates that documentation required for compliance with 44 CFR Section 65.10 of the NFIP regulations will be provided within a specified timeframe, depending upon the levee's status. Flood insurance is not mandatory for structures behind a levee with provisional status however, it is strongly encouraged.



Levee Not Accredited or De-accredited on FIRM

If the levee is not shown as providing protection from the 1-percent-annual-chance flood on an effective FIRM, the levee is considered "not accredited" and is mapped as Zone AE or Zone A, depending upon the type of study performed for the area. If the levee was previously shown providing protection from the 1-percent-annual-chance flood on an effective FIRM but does not meet the Provisionally Accredited Levee (PAL) requirements or is no longer eligible for the PAL, FEMA will "de-accredit" the levee and the area landward of the levee will be remapped as Zone AE or Zone A (high-risk flood zones) depending on the type of study performed for the area. Flood insurance will be required for structures with a federally backed mortgage.

Design Criteria*	Section of the NFIP Regulations: 65.10(b)
Description: For levees to be recognized by FEMA, evidence that adequate design and operation and maintenance systems are in place to provide reasonable assurance that protection from the base flood exists must be provided. The following requirements must be met:	
Checklist for Design Criteria:	
■	**Freeboard.** Minimum freeboard required 3 feet above the Base Flood Elevation (BFE) all along length, and an additional 1 foot within 100 feet of structures (such as bridges) or wherever the flow is restricted. Additional 0.5 foot at the upstream end of levee. Coastal levees have special freeboard requirements (see 65.10(b)(1)(iii) and (iv)).
■	**Closures.** All openings must be provided with closure devices that are structural parts of the system during operation and designed according to sound engineering practice.
■	**Embankment Protection**. Engineering analyses must be submitted that demonstrate that no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of the seepage path and subsequent instability.
■	**Embankment and Foundation Stability Analyses.** Engineering analyses that evaluate levee embankment stability must be submitted. The analyses provided shall evaluate expected seepage during loading conditions associated with the base flood and shall demonstrate that seepage into or through the levee foundation and embankment will not jeopardize embankment or foundation stability. An alternative analysis demonstrating that the levee is designed and constructed for stability against loading conditions for Case IV as defined in the U.S. Army Corps of Engineers (USACE) manual, *Design and Construction of Levees*, (EM 1110–2–1913, Chapter 6, Section II), may be used.
■	**Settlement Analyses.** Engineering analyses must be submitted that assess the potential and magnitude of future losses of freeboard as a result of levee settlement and demonstrate that freeboard will be maintained. This analysis must address embankment loads, compressibility of embankment soils, compressibility of foundation soils, age of the levee system, and construction compaction methods. In addition, detailed settlement analysis using procedures such as those described in the USACE manual, *Soil Mechanics Design— Settlement Analysis* (EM 1100–2–1904), must be submitted.
■	**Interior Drainage.** An analysis must be submitted that identifies the source(s) of such flooding, the extent of the flooded area, and, if the average depth is greater than one foot, the water-surface elevation(s) of the base flood. This analysis must be based on the joint probability of interior and exterior flooding and the capacity of facilities (such as drainage lines and pumps) for evacuating interior floodwaters.

Operation Plan* Section of the NFIP Regulations: 65.10(c)(1)	
Description: For a levee system to be recognized, the operational criteria must be as described below. All closure devices or mechanical systems for internal drainage, whether manual or automatic, must be operated in accordance with an officially adopted operation manual, a copy of which must be provided to FEMA by the operator when levee or drainage system recognition is being sought or when the manual for a previously recognized system is revised in any manner. All operations must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP.	
Checklist for Operation Plan:	
■	**Flood Warning System.** Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials that will be used to trigger emergency operation activities; and demonstration that sufficient flood warning time exists for the completed operation of all closure structures, including necessary sealing, before floodwaters reach the base of the closure.
■	**Plan of Operation.** A formal plan of operation including specific actions and assignments of responsibility by individual name or title.
■	**Periodic Operation of Closures.** Provisions for periodic operation, at not less than one-year intervals, of the closure structure for testing and training purposes.
■	**Interior Drainage Plan.** See below.

Interior Drainage Plan Section of the NFIP Regulations: 65.10(c)(2)	
Description: Interior drainage systems associated with levee systems usually include storage areas, gravity outlets, pumping stations, or a combination thereof. These drainage systems will be recognized by FEMA on NFIP maps for flood protection purposes only if the following minimum criteria are included in the operation plan.	
Checklist for Interior Drainage Plan:	
■	**Flood Warning System.** Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials that will be used to trigger emergency operation activities; and demonstration that sufficient flood warning time exists to permit activation of mechanized portions of the drainage system.
■	**Plan of Operation.** A formal plan of operation including specific actions and assignments of responsibility by individual name or title.

■	**Manual Backup.** Provision for manual backup for the activation of automatic systems.
■	**Periodic Inspection.** Provisions for periodic inspection of interior drainage systems and periodic operation of any mechanized portions for testing and training purposes. No more than 1 year shall elapse between either the inspections or the operations.

Maintenance Plan	Section of the NFIP Regulations: 65.10(d)

Description: For levee systems to be recognized as providing protection from the base flood, the maintenance criteria must be as described herein:

Checklist for Maintenance Plan:	
■	Levee systems must be maintained in accordance with an officially adopted maintenance plan, and a copy of this plan must be provided to FEMA by the owner of the levee system when recognition is being sought or when the plan for a previously recognized system is revised in any manner.
■	All maintenance activities must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP that must assume ultimate responsibility for maintenance.
■	This plan must document the formal procedure that ensures that the stability, height, and overall integrity of the levee and its associated structures and systems are maintained. At a minimum, the plan shall specify the maintenance activities to be performed, the frequency of their performance, and the person by name or title responsible for their performance.

Certification	Section of the NFIP Regulations: 65.10(c)

Description: Data submitted to support that a given levee system complies with the structural requirements set forth in "Design Criteria" (paragraphs (b)(1) through (7) of the regulations) must be certified by a registered PE. Also, certified "as-built" plans of the levee must be submitted. Certifications are subject to the definition given in Section 65.2 of the NFIP regulations. In lieu of these structural requirements, a Federal agency with responsibility for levee design may certify that the levee has been adequately designed and constructed to provide protection against the base flood.

Checklist for Certification Requirement:	
■	All data submitted is certified by Professional Engineer or certified by a Federal agency.
■	Certified as-built levee plans are included in the submittal.

A NOTE ABOUT RISK AND FLOOD INSURANCE

It is important to note that levees are designed to provide a *specific level of protection.* They can be overtopped or fail in a larger flood events.

Levees also decay over time. They require regular maintenance and periodic upgrades to retain their level of protection. When levees do fail, they fail catastrophically. The damage may be more significant than if the levee was not there at all.

For all these reasons, FEMA strongly urges people to understand their flood risk, know their evacuation procedures, and protect their property by purchasing flood insurance.

CHECKLIST INFORMATION

The checklist provided in this publication is meant to assist local officials and levee owners in gathering the documentation that will be required for FEMA to show a levee as providing base flood protection on the community's FIRM. Where possible, text from the actual NFIP regulations (44 CFR Section 65.10) was used.

The checklist is set up according to the appropriate paragraph of 65.10. For example, Design Criteria can be found in Paragraph 65.10(b):

Design Criteria*	Section of the FEMA Regulations: 65.10(b)
Description: For levees to be recognized by FEMA, evidence that adequate design and operation and maintenance systems are in place to provide reasonable assurance that protection from the base flood exists must be provided. The following requirements must be met:	

For a comprehensive description of each item in this checklist, please see Appendix H of the *Guidelines and Specifications for Flood Hazard Mapping Partners*. Locations of this resource, and other useful resources, are provided below.

INDEX OF RESOURCES

This resource, and other levee-related information and materials, can be found at www.fema.gov/plan/prevent/fhm/lv_intro.shtm.

Procedure Memorandum No. 34, *Interim Guidance for Studies Including Levees,* can be found at www.fema.gov/plan/prevent/fhm/lv_fpm.shtm.

Revised Procedure Memorandum No. 43, *Guidelines for Identifying Provisionally Accredited Levees,* can be found at www.fema.gov/plan/prevent/fhm/lv_fpm.shtm.

Appendix H of the *Guidelines and Specifications for Flood Hazard Mapping Partners* can be downloaded at www.fema.gov/plan/prevent/fhm/dl_cgs.shtm.

44 CFR Section 65.10 of the NFIP regulations can be downloaded at www.fema.gov/plan/prevent/fhm/lv_fpm.shtm.

Flood insurance information can be found at www.fema.gov/business/nfip or on the NFIP's consumer site, www.FloodSmart.gov.

a reissuance or revision of the flood insurance study or maps and will be deferred until such time as a significant change occurs;

(f) An additional 90 days is required to evaluate the scientific or technical data submitted; or

(g) Additional data are required to support the revision request.

(h) The required payment has not been submitted in accordance with 44 CFR part 72, no review will be conducted and no determination will be issued until payment is received.

[51 FR 30315, Aug. 25, 1986; 61 FR 46331, Aug. 30, 1996, as amended at 62 FR 5736, Feb. 6, 1997]

§ 65.10 Mapping of areas protected by levee systems.

(a) *General.* For purposes of the NFIP, FEMA will only recognize in its flood hazard and risk mapping effort those levee systems that meet, and continue to meet, minimum design, operation, and maintenance standards that are consistent with the level of protection sought through the comprehensive flood plain management criteria established by § 60.3 of this subchapter. Accordingly, this section describes the types of information FEMA needs to recognize, on NFIP maps, that a levee system provides protection from the base flood. This information must be supplied to FEMA by the community or other party seeking recognition of such a levee system at the time a flood risk study or restudy is conducted, when a map revision under the provisions of part 65 of this subchapter is sought based on a levee system, and upon request by the Administrator during the review of previously recognized structures. The FEMA review will be for the sole purpose of establishing appropriate risk zone determinations for NFIP maps and shall not constitute a determination by FEMA as to how a structure or system will perform in a flood event.

(b) *Design criteria.* For levees to be recognized by FEMA, evidence that adequate design and operation and maintenance systems are in place to provide reasonable assurance that protection from the base flood exists must be provided. The following requirements must be met:

(1) *Freeboard.* (i) Riverine levees must provide a minimum freeboard of three feet above the water-surface level of the base flood. An additional one foot above the minimum is required within 100 feet in either side of structures (such as bridges) riverward of the levee or wherever the flow is constricted. An additional one-half foot above the minimum at the upstream end of the levee, tapering to not less than the minimum at the downstream end of the levee, is also required.

(ii) Occasionally, exceptions to the minimum riverine freeboard requirement described in paragraph (b)(1)(i) of this section, may be approved. Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted to support a request for such an exception. The material presented must evaluate the uncertainty in the estimated base flood elevation profile and include, but not necessarily be limited to an assessment of statistical confidence limits of the 100-year discharge; changes in stage-discharge relationships; and the sources, potential, and magnitude of debris, sediment, and ice accumulation. It must be also shown that the levee will remain structurally stable during the base flood when such additional loading considerations are imposed. Under no circumstances will freeboard of less than two feet be accepted.

(iii) For coastal levees, the freeboard must be established at one foot above the height of the one percent wave or the maximum wave runup (whichever is greater) associated with the 100-year stillwater surge elevation at the site.

(iv) Occasionally, exceptions to the minimum coastal levee freeboard requirement described in paragraph (b)(1)(iii) of this section, may be approved. Appropriate engineering analyses demonstrating adequate protection with a lesser freeboard must be submitted to support a request for such an exception. The material presented must evaluate the uncertainty in the estimated base flood loading conditions. Particular emphasis must be placed on the effects of wave attack and overtopping on the stability of the levee. Under no circumstances, however, will a freeboard of less than two

feet above the 100-year stillwater surge elevation be accepted.

(2) *Closures.* All openings must be provided with closure devices that are structural parts of the system during operation and design according to sound engineering practice.

(3) *Embankment protection.* Engineering analyses must be submitted that demonstrate that no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of the seepage path and subsequent instability. The factors to be addressed in such analyses include, but are not limited to: Expected flow velocities (especially in constricted areas); expected wind and wave action; ice loading; impact of debris; slope protection techniques; duration of flooding at various stages and velocities; embankment and foundation materials; levee alignment, bends, and transitions; and levee side slopes.

(4) *Embankment and foundation stability.* Engineering analyses that evaluate levee embankment stability must be submitted. The analyses provided shall evaluate expected seepage during loading conditions associated with the base flood and shall demonstrate that seepage into or through the levee foundation and embankment will not jeopardize embankment or foundation stability. An alternative analysis demonstrating that the levee is designed and constructed for stability against loading conditions for Case IV as defined in the U.S. Army Corps of Engineers (COE) manual, "Design and Construction of Levees" (EM 1110–2–1913, Chapter 6, Section II), may be used. The factors that shall be addressed in the analyses include: Depth of flooding, duration of flooding, embankment geometry and length of seepage path at critical locations, embankment and foundation materials, embankment compaction, penetrations, other design factors affecting seepage (such as drainage layers), and other design factors affecting embankment and foundation stability (such as berms).

(5) *Settlement.* Engineering analyses must be submitted that assess the potential and magnitude of future losses of freeboard as a result of levee settlement and demonstrate that freeboard will be maintained within the minimum standards set forth in paragraph (b)(1) of this section. This analysis must address embankment loads, compressibility of embankment soils, compressibility of foundation soils, age of the levee system, and construction compaction methods. In addition, detailed settlement analysis using procedures such as those described in the COE manual, "Soil Mechanics Design—Settlement Analysis" (EM 1100–2–1904) must be submitted.

(6) *Interior drainage.* An analysis must be submitted that identifies the source(s) of such flooding, the extent of the flooded area, and, if the average depth is greater than one foot, the water-surface elevation(s) of the base flood. This analysis must be based on the joint probability of interior and exterior flooding and the capacity of facilities (such as drainage lines and pumps) for evacuating interior floodwaters.

(7) *Other design criteria.* In unique situations, such as those where the levee system has relatively high vulnerability, FEMA may require that other design criteria and analyses be submitted to show that the levees provide adequate protection. In such situations, sound engineering practice will be the standard on which FEMA will base its determinations. FEMA will also provide the rationale for requiring this additional information.

(c) *Operation plans and criteria.* For a levee system to be recognized, the operational criteria must be as described below. All closure devices or mechanical systems for internal drainage, whether manual or automatic, must be operated in accordance with an officially adopted operation manual, a copy of which must be provided to FEMA by the operator when levee or drainage system recognition is being sought or when the manual for a previously recognized system is revised in any manner. All operations must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP.

(1) *Closures.* Operation plans for closures must include the following:

(i) Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists for the completed operation of all closure structures, including necessary sealing, before floodwaters reach the base of the closure.

(ii) A formal plan of operation including specific actions and assignments of responsibility by individual name or title.

(iii) Provisions for periodic operation, at not less than one-year intervals, of the closure structure for testing and training purposes.

(2) *Interior drainage systems.* Interior drainage systems associated with levee systems usually include storage areas, gravity outlets, pumping stations, or a combination thereof. These drainage systems will be recognized by FEMA on NFIP maps for flood protection purposes only if the following minimum criteria are included in the operation plan:

(i) Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials, that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists to permit activation of mechanized portions of the drainage system.

(ii) A formal plan of operation including specific actions and assignments of responsibility by individual name or title.

(iii) Provision for manual backup for the activation of automatic systems.

(iv) Provisions for periodic inspection of interior drainage systems and periodic operation of any mechanized portions for testing and training purposes. No more than one year shall elapse between either the inspections or the operations.

(3) *Other operation plans and criteria.* Other operating plans and criteria may be required by FEMA to ensure that adequate protection is provided in specific situations. In such cases, sound emergency management practice will be the standard upon which FEMA determinations will be based.

(d) *Maintenance plans and criteria.* For levee systems to be recognized as providing protection from the base flood, the maintenance criteria must be as described herein. Levee systems must be maintained in accordance with an officially adopted maintenance plan, and a copy of this plan must be provided to FEMA by the owner of the levee system when recognition is being sought or when the plan for a previously recognized system is revised in any manner. All maintenance activities must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP that must assume ultimate responsibility for maintenance. This plan must document the formal procedure that ensures that the stability, height, and overall integrity of the levee and its associated structures and systems are maintained. At a minimum, maintenance plans shall specify the maintenance activities to be performed, the frequency of their performance, and the person by name or title responsible for their performance.

(e) *Certification requirements.* Data submitted to support that a given levee system complies with the structural requirements set forth in paragraphs (b)(1) through (7) of this section must be certified by a registered professional engineer. Also, certified as-built plans of the levee must be submitted. Certifications are subject to the definition given at §65.2 of this subchapter. In lieu of these structural requirements, a Federal agency with responsibility for levee design may certify that the levee has been adequately designed and constructed to provide protection against the base flood.

[51 FR 30316, Aug. 25, 1986]

§65.11 Evaluation of sand dunes in mapping coastal flood hazard areas.

(a) *General conditions.* For purposes of the NFIP, FEMA will consider storm-induced dune erosion potential in its determination of coastal flood hazards and risk mapping efforts. The criterion to be used in the evaluation of dune erosion will apply to primary frontal dunes as defined in §59.1, but does not